Assistant Secretary for Environment, Safety and Health

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E&H SYNERGY

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U.S.—Russian Radiation Health Studies Move Ahead

On April 24-25, 1997, Dr. Tara O'Toole, Assistant Secretary for Environment, Safety and Health, hosted the Third Meeting of the U.S.—Russian Joint Coordinating Committee for Radiation Effects Research (JCCRER) in Bethesda, Maryland. The JCCRER was established in 1994 to implement an agreement signed by then U.S. Secretary of State Warren Christopher and Russian Federation Foreign Minister Andrey Kozyrev. The two nations agreed to support and facilitate joint cooperative research and exchange of information on the health and environmental effects of radiation. Since that time, joint epidemiologic and dosimetric feasibility studies related to the workers and population exposed to radiation released from the MAYAK nuclear weapons production plant in the Southern Ural mountains have confirmed the research value of exposure and health data previously collected by the Russians. Several long-term health effects studies based on these data are already underway.

The Department of Energy (DOE) is also supporting a separate, but related, project that involves microfilming worker and population health records at several sites

Continued on Page 3

Russian and American JCCRER co-chairs, Tara O'Toole and Sergei Khetagurov, assisted by JCCRER Executive Committee co-chairs, Frank Hawkins and Leonid Bolshov, sign the Memorandum of Meeting and JCCRER policy statements.

Administration Responds to Human Radiation Experiment Advisory Committee

On March 28, 1997, Secretary of Energy Federico Peña, Assistant Secretary for Environment, Safety and Health Tara O'Toole, and Acting Associate Attorney General John Dwyer held a press briefing at the White House to make public the Administration's response to the recommendations of the Advisory Committee on Human Radiation Experiments. President Clinton established the Advisory Committee in January 1994 to study whether the government had funded and conducted unethical human radiation experiments and releases of radiation during World War II and throughout the Cold War period.

In accepting the Committee's report in October 1995, the President instructed his Cabinet to use and build on the recommendations and assured the Committee and the public that the report "will not be left on a shelf to gather dust." Federal agencies, including DOE, have been actively working to implement the Advisory Committee recommendations. The Interagency Working Group on Human Radiation Experiments report, *Building Public Trust: Actions to Respond to the Advisory Committee on Human Radiation Experiments*, outlines the government's efforts over the last year-and-a-half. Members of the Interagency Working Group on Human Radiation Experiments included the Departments of Defense (DOD), Health and Human Services (HHS), Justice (DOJ), Veterans Affairs (VA), the National Aeronautics and Space Administration (NASA), and the Central Intelligence Agency (CIA).

On behalf of President Clinton, Secretary Peña announced important milestones in the Administration's continuing efforts to improve openness in government, strengthen

Continued on Page 3

In this Issue . . .

ES&H SYNERGY

ES&H Synergy is a quarterly newsletter published by DOE's Office of Environment, Safety and Health (EH) to promote awareness and information exchange of all environment, safety, and health issues impacting DOE personnel and contractors. Each issue highlights Headquarters and field initiatives in environment, health physics, nuclear and facility safety, occupational medicine, and occupational safety and health. To be added to the distribution list or to receive a copy of this publication, call 1-800-473-4375. *Synergy* is also available electronically through Technical Information Services at *http://tis-hq.eh.doe.gov/docs/synergy/synergy.html.*

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U.S.—Russian Radiation Health Studies Move Ahead continued from page 1

associated with the MAYAK production plant. Microfilming these records will preserve the data and help to ensure the viability of the joint long-term JCCRER studies. The data obtained from the joint efforts is expected to help answer critical questions on the health impacts associated with long-term, low-level radiation exposure that have not been answered by previous health studies of atomic bomb survivors in Japan and nuclear workers in the United States and Western Europe.

In addition to DOE's participation in the JCCRER, several other U.S. Federal agencies, including the Department of Defense, Department of Health and Human Services (Centers for Disease Control and Prevention), Nuclear Regulatory Commission, National Aeronautics and Space Administration, and Environmental Protection Agency, support JCCRER research studies.

During the April meeting, American and Russian JCCRER co-chairs, Dr. O'Toole and Mr. Khetagurov, on behalf of the joint JCCRER, approved two population dosimetry studies, as well as policy statements related to public involvement, access to primary data, and financing of the joint studies. They also led discussions on issues and activities presented by meeting participants associated with ongoing and future studies. The next joint JCCRER meeting is tentatively scheduled for the week of May 18, 1998, in Russia.

Please contact Libby White, Office of International Health Studies, (301) 903-7582 or e-mail (*elizabeth.white@eh.doe.gov*) if you have questions about the meeting or would like additional information about the JCCRER.

The Department of Energy (DOE) Federal Employee Occupational Safety and Health (FEOSH) Program's Home Page

http://tis.eh.doe.gov/feosh

The Department of Energy (DOE) Worker Health and Safety Home Page

http://tis.eh.doe.gov/whs

The Office of Worker Health and Safety's Beryllium Worker Protection Home Page

http://tis.eh.doe.gov/be

Administration Responds to Human Radiation Experiment Advisory Committee continued from page 1

ethics in human subjects research, and compensate individuals for the government's mistakes. These milestones include:

- Settlement of compensation claims with the families of 16 of the 18 plutonium-injection subjects. Of the two remaining subjects, one was never found and the family of the other refused compensation. A settlement was also reached with the subject of a uranium-injection study. The settlements, totaling $6.5 million, represent compensation to all known individuals recommended for compensation by the Committee.

- Proposed amendments to the Radiation Exposure Compensation Act of 1990 (RECA) to compensate hundreds of uranium miners who would not be compensated under current law. The proposed amendments will bring the compensation criteria in RECA in line with current science and will address some of the issues of fairness raised by the Committee.

- Issuance of a Presidential directive to strengthen the rights and protections of people participating in secret, government-supported research. The directive requires scientists to (1) obtain informed consent from all potential subjects of all secret experiments; (2) disclose the identity of the sponsoring agency to potential subjects; and (3) tell potential subjects that an experiment is classified. The directive also establishes a more independent review process and requires the approval of the head of the agency and the maintenance of permanent records of secret experiments. The President also directed Federal agencies to report annually on classified human research projects. A preliminary review by the Interagency Working Group indicates that the government is not supporting any classified human research at this time.

Secretary Peña applauded the efforts of the Department of Energy in leading the interagency effort to promote openness in government and said that he was "proud to continue the very important legacy that my predecessor, Hazel O'Leary, started as Secretary of Energy."

Making information available to the public via the Internet has been a central component of the Department's Openness Initiative. The complete transcript of the press briefing and the Interagency Working Group report, *Building Public Trust* (including the Presidential Directive on "Strengthened Protections for Human Subjects of Classified Research" and the proposed amendments to RECA) can be found on the Human Radiation Experiment Home Page (*www.ohre.doe.gov*), which is sponsored by the DOE Office of Human Radiation Experiments (OHRE). This recently upgraded home page provides access to numerous information resources and documents that tell the story of human radiation experiments, including the Human Radiation Experiments Information Management System (HREX). HREX, located at *hrex.dis.anl.gov*, was originally developed by OHRE in 1995 to provide public access to the 250,000 pages of documents collected during its research process. Other agencies involved in the human radiation experiments project (DOD, HHS, VA, NASA, and CIA) joined DOE to create an interagency system version of the HREX. Ultimately, the system will contain half a million pages of historical documents.

To obtain a copy of the working group's report, *Building Public Trust: Actions to Respond to the Advisory Committee on Human Radiation Experiments*, contact the ES&H Helpline at (301) 903-8358 or 1-800-473-4375, Monday through Friday, 7:00 a.m. to 7:00 p.m.(EST).

United States Transuranium and Uranium Registries Program Depends on Tissues from Volunteers

Since French physicist Henri Becquerel discovered the radioactive properties of uranium ore in 1896, a number of new and potentially highly radioactive elements, including plutonium and americium, have been created. To learn about the possible biological effects of these man-made elements on humans and to ensure the adequacy of radiation safety standards, a program for their study was begun in 1968 under the auspices of the Atomic Energy Commission. This program, now called the United States Transuranium and Uranium Registries (USTUR), depends on the postmortem contributions of tissues from volunteers (registrants) who have been exposed to these materials.

USTUR research is currently conducted under a grant to Washington State University. Through careful examination and analyses of contributed tissues, a great deal has been learned about how and where plutonium and americium are deposited in the human body and about how their doses are distributed among the various tissues and organs. USTUR has verified and validated some of the basic information used to establish radiation protection standards. The studies have also suggested changes to other parameters on which such standards are based. Some of these parameters depend on determining how long these materials remain in a particular tissue, where they go from there, what portion might come back to that tissue, and how quickly they are excreted. For example, a new USTUR study for americium shows that americium leaves the liver about 10 times more rapidly than researchers previously thought. This means that the dose and, therefore, the risk of harmful effects to the liver are less than had been expected.

The USTUR also collaborates with other organizations (including those in foreign countries) that have similar registries. One important collaboration is with the Russians, who have maintained a similar program for a number of years. This joint Russian—USTUR research will compare the radiochemical analytical methods of the two registries to determine how their results can be combined. Because the Russians have many more registrants, including more females, and the Russian doses were much higher, combining their data with those in USTUR should result in better estimates of organ doses and risks from exposure to man-made elements. This will provide a better opportunity for determining the biological effects of various dose rates.

In addition to publishing results in numerous peer-reviewed scientific journal articles over the years, USTUR publishes a newsletter and an annual report that summarize progress and accomplishments. Single copies of these publications are available directly from the USTUR by calling 800-375-9317. Copies can also be ordered from the Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 38831. Additionally, information about the USTUR may be quickly found on the Internet. The USTUR Home Page is located at *http://www.tricity.wsu.edu/htmls/ustur/page1.html*. This site has a link to DOE's Comprehensive Epidemiologic Data Resource (CEDR), where data files consisting of USTUR's radiochemical tissue analyses are presented. More information about CEDR can also be found on the Internet at *http://cedr.lbl.gov*.

The work of USTUR would not be possible without the unselfish postmortem contributions promised by its several hundred registrants. Without these civic-minded individuals and their generous donations of tissue, our understanding of the possible biological effects of these radioelements would be far less complete. More significantly, without the scientific data developed by the USTUR, our confidence in the adequacy of radiation protection standards for the workplace and the public would be diminished.

For more information about USTUR, contact Barbara Brooks, Office of Epidemiologic Studies, at (301) 903-4674 or e-mail *(barbara.brooks@eh.doe.gov).*

Worker Protection Criteria Initiative and Integrated Safety Management

As part of the Defense Nuclear Facilities Safety Board (DNFSB) Recommended 95-2 initiative, the Department is taking action to better integrate safety and health programs into work activities. In addition, the Department is documenting and analyzing the pathways and approaches that form the basis for worker protection program decisions to demonstrate that responsible individuals understand the basis and affirm that the decisionmaking process is adequately implemented.

Accordingly, the DOE Safety Management Implementation Team (SMIT) is sponsoring a Worker Protection Criteria (WPC) initiative to ensure that the criteria for individual worker protection programs and safety management systems are appropriately understood and documented and to capture lessons learned and best practices for communication across DOE.

To facilitate the process, a questionnaire was developed to survey DOE practices in several areas, including hazard and risk management; linkage to integrated safety management and Work Smart Standards; performance measures; and field perspectives, guidance, and approaches. The questionnaire was transmitted to the Fernald, Hanford, Oak Ridge, Rocky Flats, and Savannah River sites to draw upon their experience in these areas.

Responses from the five volunteer sites will be compiled into a summary report of representative WPC practices, and participating organizations will present their best WPC practices and lessons learned to peers at the WPC Workshop, June 11-12, 1997, in Washington, D. C. These lessons learned and best practices will be used to effectively integrate WPC into integrated safety management and help achieve long-term results through improved safety, increased productivity, and decreased costs.

Contact Ed Patigalia, Office of Occupational Safety and Health Policy, at (301) 903-3972 or e-mail *(ed.patigalia@eh.doe.gov)* for more information on these and other WPC activities.

Federal Agencies Collaborate on Risk Communication Symposium

In response to rising public concerns about health and environmental risks, government agencies have increasingly sought improved means for communicating risk information to individual citizens and public groups. Part of this increased interest in such communication stems from current difficulties and frustrations in public dialogues pertaining to risk. Government officials are often frustrated by what they perceive to be inaccurate public perceptions of risk and unrealistic demands by the public for risk reduction. Citizens are equally frustrated by the government's seeming disinterest in their concerns, unwillingness to take action, and reluctance or unwillingness to allow them to participate in decisions that intimately affect their lives.

There are numerous new risk communication efforts within Federal agencies. The Department of Energy (DOE), for example, sponsored the development of the Consortium for Risk Evaluation with Stakeholder Participation (CRESP) to identify and develop strategies to promote community involvement in risk assessment, management, and communications processes. As part of this effort, DOE, CRESP, and the U.S. Public Health Service Environmental Health Policy Committee's Subcommittee on Risk Communication and Education collaborated to conduct a symposium to address risk communication issues.

The symposium, "Communicating Risk in a Changing World," was held at the Environmental and Occupational Health Sciences Institute (EOHSI) in Piscataway, New Jersey, in December 1996. Attendees included risk communication researchers and practitioners from government, academia, industry, and labor, who shared ideas about how changes in the environment relate to risk and how to improve the effectiveness of science-based communications with the public. The purpose of the 2-day symposium was to ensure that programs for improving risk communication among workers and communities are based on the most current and effective risk communication principles and strategies and that a consistent health-risk message is being delivered to workers and their communities. Dr. Maria Pavlova, Medical Officer, Office of Occupational Medicine and Medical Surveillance, DOE; Dr. Barry L. Johnson, U.S. Assistant Surgeon General, Assistant Administrator, Agency for Toxic Substances and Disease Registry; and Dr. Bernard D. Goldstein, Professor and Director, EOHSI, Principal Investigator of CRESP, co-chaired the symposium.

Topics addressed at the symposium included achieving better understanding of public perceptions, developing educational strategies, communicating risk comparisons, responding more effectively to the public's need for risk information in an environment of diminishing resources, the changing public view of government, the role of the Citizens Advisory Committees in government action and policy, and the role of the media in risk communication. Symposium participants also met in small groups to discuss how changes in the environment affect risk perception and risk communication and how to improve communication with the public by involving stakeholders. The groups examined six areas: environmental justice, comparative risk assessment, stakeholder broadening, the role of the media, educational strategies, and community and worker right-to-know.

Ms. Georgia Johnson, Office of Environmental Justice, leads a small group discussion on environmental justice issues. Dr. Barry L. Johnson, U.S. Assistant Surgeon General, Assistant Administrator, Agency for Toxic Substances and Disease Registry, is seated on the far right, with Dr. Arthur Upton, CRESP, who gave the closing remarks, in the foreground.

Stakeholder involvement was a theme for each of the groups. One group identified stakeholders as "all individuals potentially affected and concerned by an issue." The environmental justice group determined that fairness, rather than risk, is a primary issue and that in order to involve neighborhoods in the risk management process, leaders should recognize that responsiveness and the building of trust are essential. Another group suggested involving every important stakeholder from the start. They also suggested encouraging the open discussion of conflicting views using professional facilitators, as well as providing access to technical advice, as key to a successful process. The comparative risk assessment group noted that communication plays an important role in determining how findings are conveyed, understood, and used. They also found that determining the identity of the target audience and shaping the communications to fit its specific needs are important aspects of risk communication.

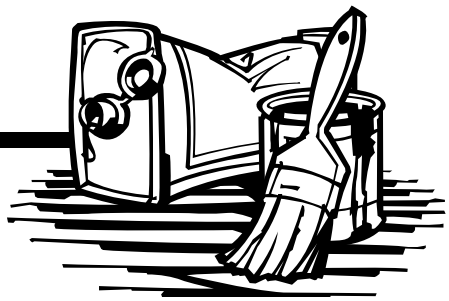
Other groups also addressed stakeholder issues and strategies, including linking risk to social, economic, and political issues to make risk more personal and relevant to the public; using workers as "ambassadors" for community education; and involving stakeholders in risk-making decisions. At the close of the conference, Dr. Arthur C. Upton, CRESP, summarized the discussions, noting how far the field of risk communication has progressed over just a few years. Dr. Barry L. Johnson concluded that "shareholder involvement (was) a constant and substantive theme" and that shareholder capacity development needs to be further addressed.

Conference proceedings are being developed for publication, and conference recommendations will be used to develop risk communication guidelines for Federal agencies. For more information, contact Dr. Maria Pavlova, Office of Occupational Medicine and Medical Surveillance, at (301) 903-3658 or e-mail (*maria.pavlova@eh.doe.gov).*

"If we think [the people] not enlightened enough to exercise their control with a wholesome discretion, the remedy is not to take it from them, but to inform their discretion."

-Thomas Jefferson

Environmental Protection Agency Addresses Health Threats to Children



The Environmental Protection Agency (EPA) has issued a report entitled *Environmental Health Threats to Children* (EPA 175-F-96-001, September 1996), noting that governmental agencies and their partners have never faced a more complex challenge than protecting children from environmental health hazards. These hazards range from asthma-inducing air pollution and lead-based paint in older homes to treatment-resistant microbes in drinking water and persistent industrial chemicals that may cause cancer or induce reproductive or developmental changes.

Under President Clinton's leadership, the EPA and other Federal agencies are making children's health considerations a priority in all of their work to protect public health and the environment. This priority includes setting strong environmental and public health standards and protection, educating the public, ensuring the public's right to know, and conducting research to answer the many questions that remain about how children's health is affected by environmental problems.

The centerpiece of this effort has been the EPA Administrator's national policy, announced on October 23, 1995, to "consistently and explicitly take into account health risks to children and infants from environmental hazards when conducting assessments of environmental risks." This policy directly responds to issues raised by the 1993 National Academy of Sciences report, *Pesticides in the Diets of Infants and Children*.

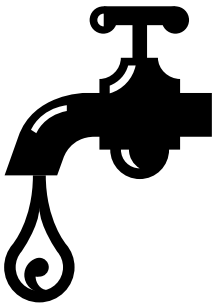
Environmental Health Threats to Children

The EPA's report on children's health states that children face an array of significant environmental threats to their health, including asthma (now the leading cause of hospital admissions for the nation's children), lead poisoning, pesticides, drinking water contaminants, toxic and industrial waste sites, PCBs, second-hand tobacco smoke, and overexposure to the sun. Some environmental risks for children are just beginning to be more fully understood. These risks include the potential effects on the endocrine system resulting from exposure to pesticides and industrial chemicals, as well as the potential effects on the respiratory system from exposure to particulate matter air pollution. Children are particularly at risk from environmental hazards for several reasons.

- Because children's systems are still developing, they are more susceptible to environmental threats. Exposure to toxic substances can affect fetal, infant, and childhood growth, impairing development of their nervous systems and causing abnormal development because of hormonal or immunologic effects. Also, infant immune systems are less well developed. Consequently, they may, for example, be less able than healthy adults to recover rapidly from microbial infections, such as one from cryptosporidium found in drinking water.
- Because children eat proportionately more food, drink more fluids, breathe more air, and play more outside, they are more exposed to environmental threats. Children ingest more pollutants per pound of body weight than adults. Their immature skin and body tissues are at greater risk to damage from the sun and can more readily absorb many harmful substances.
- Because children are less able to protect themselves, their behavior exposes them to different environmental hazards. When young children crawl on the ground or floor or play outside, they face greater exposure to potentially contaminated dust and soil, lead paint, household chemicals, garden chemicals, and other potentially hazardous substances.

Research Priorities

EPA's research priorities are an important part of its agenda focused on children. Included among its efforts are the following.



- focusing air pollution research on the link between health effects and exposure to toxic air pollutants
- defining the risks of microbial contaminants in drinking water
- improving scientific knowledge about children's exposure to pesticides
- basing pesticide standards on children's actual exposures
- conducting better assessments of risks unique to children
- setting standards based on combined risks to children resulting from exposures to different chemicals with the same mode of action
- researching potential adverse effects on the endocrine system resulting from exposure to pesticides and industrial chemicals
- improving scientific knowledge about fine particle air pollution
- improving scientific knowledge concerning the effects of mercury and its various forms (e.g., methyl mercury) on children's health.

Setting Standards

Two of the greatest steps in protecting children's health were EPA's ban on lead in gasoline 20 years ago and the Consumer Product Safety Commission's ban on lead in paint. These bans resulted in a 98 percent reduction in lead levels in the air and protected millions of children from serious, permanent learning disabilities by helping to reduce blood lead levels by 75 percent, according to Centers for Disease Control data. Examples of some recent steps in reducing environmental hazards to children include:

- protecting children from pesticides by strengthening the nation's food safety laws (Food Quality Protection Act) to limit the risks of pesticide exposure
- protecting infants from microbial contaminants in drinking water by requiring large water systems to test source water for contaminants such as cryptosporidium
- protecting children from dangerous air pollution with new, more protective controls on air emissions from incinerators that burn hazardous waste
- protecting children from exposure to carelessly dumped toxic waste by accelerating the Superfund toxic waste cleanup program
- protecting mothers and infants from contaminated fish and polluted waters by undertaking a number of specific activities to reduce sources of PCB and mercury contamination.

EPA has made its national agenda to protect children's health from environmental threats a high priority to ensure that children receive the protection they need and deserve and to help the nation fulfill its obligation to protect future generations.

Information in this article is derived from EPA's report, *Environmental Health Threats to Children.* The complete report, including access information for many shorter reports and videos on specific topics, such as lead poisoning and safe drinking water, is available on EPA's Web site, *http://www.epa.gov/epahome/children.htm.*

Corporate Attitudes About the Environment Examined

A recent report prepared by Resources for the Future for the Global Environmental Management Initiative (GEMI) detailed a study that examined the evolution of environmental, health, and safety (EHS) attitudes, management systems, and performance over the past two decades. The study also examined resources for the future and the response of a selected number of leading companies to incentive-based government initiatives. The field of EHS management has been a highly dynamic one, reflecting both the economic, structural, and behavioral changes within multi-national corporations and the changes in American society and government policy that create pressures for improved EHS performance.

Evolution of Environmental Management Systems

In the past two decades, the design and implementation of private-sector EHS management systems have evolved as separate management practices. For purposes of clarity and simplicity, Resources for the Future chose to subdivide the timeframe of this evolution into two periods: the 1970s to the late 1980s (the traditional environmental management system) and the late 1980s to the present day (the contemporary EHS management system). Researchers found that from the 1970s to the late 1980s the modification in the attitudes corporations exhibit towards environmental issues, the development of formalized systems to achieve specific environmental goals and practices, and improved levels of EHS performance are among the greatest changes in environmental management practices.

Traditional, Contemporary, and Future Drivers of Corporate Attitudes

To identify and assess the factors that shape the evolution of corporate EHS attitudes, management systems, and performance, researchers used the concept of external and internal drivers. Public opinion, laws and regulations, and liability, litigation, and enforcement were high-priority external drivers for **traditional** EHS systems. The high-priority internal drivers were corporate values; executive leadership; and accidents, spills, and crises.

Researchers found that the high-priority external drivers for **contemporary** EHS systems are Federal and state regulations; reputation, public relations value, and public opinion; external stakeholder expectations; and liability, litigation, and threat of enforcement. High-priority internal drivers are opportunities to avoid or reduce costs, management attitudes and values, and changes in senior management.

The study also considered f**uture** drivers through the year 2000 and beyond. Researchers expect the high-priority external drivers during this timeframe to be customer expectations, external stakeholders, market opportunities, and reputation/public relations value. They anticipate that opportunities to avoid or reduce costs, as well as shareholder values and management attitudes and values, will be the high-priority internal drivers of the future.

Incentive Programs

Resources for the Future also studied incentive programs, including EPA's 33/50 project, the 1990 Clean Air Act SO_2 emission trading program, the Common Sense Initiative (CSI), Project XL, and OSHA's Star Program. (For a description of these five programs, see the accompanying article, "Federal Initiatives to Improve Environmental Performance Evaluated.") The executives interviewed by Resources for the Future researchers generally preferred programs such as OSHA Star and 33/50 over the CSI and Project XL. A smaller number of companies had participated in the SO_2 trading program, but interviewees reported that their experiences have also been positive. Companies preferred OSHA Star and 33/50 for several reasons. Executives expressed a preference for these programs because they dovetailed closely with internal plans or programs to improve environmental and safety performance, enabled participants to have a major voice in establishing goals, preserved implementation flexibility, and reduced oversight and reporting, They also led to improved relationships with regulatory agencies and stakeholders, encouraged participation and competition among employees and plants to achieve goals, and conferred reputation benefits.

Successes achieved from broad company participation in these five initiatives have helped further legitimize the role of incentive-based programs and encouraged the development of alternatives to traditional command-and-control regulation. However, these programs have not fundamentally altered public policies by incorporating the concept of continuous improvement into their design. Researchers found that the disincentives have begun to outweigh the incentives for a growing number of companies that participate in the incentive-based voluntary initiatives they reviewed during the study.

The Resources for the Future study indicates that incentive-based EHS programs need to be leveraged with other factors shaping corporate EHS governance if they are to be to be more successful. These factors include more simplified administrative reporting and stakeholder processes that directly focus the investment of people and money on the attainment of specific EHS goals; greater certainty and shorter-timeframes to ensure that significant EHS benefits will occur; and enhanced ability for companies enrolled in incentive-based programs to negotiate participation criteria and project implementation oversight, reporting, and review. Greater flexibility to define and achieve specific EHS goals and correct performance deficiencies and the ability to link such programs to the achievement of company-specific business objectives, such as cost reduction and accelerated product development schedules, are also important factors for successful programs.

In general, those companies surveyed for this study believe that an incentive-based approach to environmental management is valuable for both economic (e.g., direct cost savings, reduced management and staff time) and environmental reasons (e.g., as an additional tool to promote improved environmental performance). Despite the many criticisms of specific incentive-based initiatives reviewed in the study, these companies conclude that, overall, incentive-based programs represent a better alternative than the continuation of the traditional approach to command-and-control regulation.

Conclusion

Over the past decade a growing consensus has emerged among policymakers, businesses, and members of the professional community that the existing command-and-control system of regulation needs to be streamlined and refocused to address higher priority health and environmental risks. Overlapping these developments, a parallel set of initiatives has emerged that, at times, supplements major elements of the existing regulatory system. These alternatives include economic banking, trading, and incentive programs; voluntary pollution reduction initiatives; regulatory negotiation; environmental partnerships focused on specific pollution issues; and many others. Some of these concepts have been adopted through legislation or policy; others continue to be actively debated within the Congress and Executive Branch as well as among state agencies and the professional and stakeholder communities.

The GEMI report recommends that as experimental programs continue and are improved, consideration should be given to simply making them bolder—environmental objectives need to be made clearer and more measurable, and existing incentives for participation should be made more significant. DOE elements that are participating in the five federal incentive-based programs should follow these programs carefully for any new developments initiated by EPA or OSHA because they may affect DOE facilities in the future.

A large inventory of EHS management literature is included with the GEMI report. The citations noted generally contain case studies of precedent-setting information on the following topics: management theory and practice; environmental management; corporate environmental, health, and safety reports; and specific industry sectors such as automobiles, consumer products, electric utilities, electronics/telecommunications/semi-conductors, financial community, forest products, manufacturing, petrochemical, and others.

Information in this article was derived from *Corporate Environmental, Health and Safety Practices in Transition: Management System Responses to Changing Public Expectations, Regulatory Requirements and Incentives*, a report prepared for GEMI in September 1996. GEMI is located at 1090 Vermont Avenue, Third Floor, Washington DC 20005; telephone: (202) 296-7449. The report is also accessible via Internet at *http://www.gemi.org*.

Federal Initiatives to Improve Environmental Performance Evaluated

The Global Environmental Management Initiative (GEMI), a not-for-profit organization of 21 leading corporations, recently sponsored several independent research projects to better define and characterize incentives that could lead to improved environmental performance by business. In one project, five major Federal environmental and safety programs were examined to identify the elements of each program that could cause businesses to behave in a manner different from that required under a traditional "command and control" approach. The programs evaluated included the Occupational Safety and Health Administration (OSHA) Star program and four Environmental Protection Agency (EPA) initiatives: the 33/50 Program, the Common Sense Initiative (CSI), Project XL, and the sulphur dioxide (SO_2) emissions trading program. These programs represent the most prominent current efforts to motivate environmental improvement by business firms outside of the traditional Federal "command-and-control" framework.

GEMI's premise is that well-structured incentive programs can be very effective in advancing environmental objectives and making pollution control more efficient for the private sector. GEMI also believes that incentive-based programs have tremendous promise for advancing continuous improvement and total quality environmental management in corporate programs. However, the report states that the five programs have not lived up to that promise. According to the report, "four of these five programs (SO_2 emissions trading is different in almost every way from the other four programs) are peripheral, both to business and society. They do not address most of the important problems with the pollution control system, nor do they contribute significantly to improving environmental quality or safety."

Participants in the five incentive programs are following these programs for any new developments initiated by EPA and OSHA following GEMI's evaluation of the new initiatives.

Five Federal Incentive Programs

EPA's **33/50 Program** is a voluntary pollution-prevention initiative begun in the late 1980s and formally announced in 1991. The program sought voluntary cooperation from industrial firms to significantly cut toxic chemicals in releases and transfers, primarily through source reduction. The program used EPA's Toxic Release Inventory (TRI) to monitor participating firms' releases. The TRI is the accumulation of facility-reported information describing releases to air, water, and land of some 450 chemicals. EPA encouraged companies that reported using or releasing 1 or more of 17 target chemicals to join the 33/50 Program. Of the 8,000 companies invited, about 16 percent participated. The program had three goals: an interim reduction goal to reduce the 17 target TRI pollutants by 33 percent (491 million pounds) by 1992; an ultimate reduction goal to reduce the same 17 TRI pollutants by 50 percent (744 million pounds) by 1995; and a general goal to show that voluntary pollution-reduction programs work faster than the traditional regulatory approach. EPA reports that all three of the goals have been fulfilled, but the GEMI report has strongly criticized the program's evaluation methods.

CSI is EPA's effort to improve environmental management by moving away from media-specific management towards an approach based on the functional characteristics of industrial production. Six sectors are involved in the pilot phase of the initiative: auto manufacturing, computers and electronics, iron and steel, metal finishing and plating, petroleum refining, and printing. EPA drew most of CSI's 150 members from industry (sector representatives) and environmental, labor, and equity groups (external stakeholder representatives). Of the 40 projects proposed by CSI members, those which appear most promising fall into the category of projects to improve permitting and reporting requirements. The initiative has fallen short of its original goal because EPA lacks the statutory authority to conduct such efforts. However, CSI represents an important first step in identifying better ways to manage industrial performance. The initiative has clearly helped to incubate some innovative ideas that may ultimately result in cleaner, cheaper, and smarter environmental management strategies.

Project XL is the Administration's effort to provide excellent corporate environmental performers with enhanced statutory and regulatory flexibility. Unlike CSI, which targets industrial sectors, the XL program is aimed at industrial facilities and the communities surrounding them. Still in its formative stages, many projects are at the proposal level or in an early development phase. Most notably, all projects promise to promote using innovative pollution control, compliance, and prevention approaches. EPA characterizes Project XL as an "enforcement experiment." Under a policy of "discretionary enforcement," EPA uses its discretion not to pursue particular violations at participating facilities in recognition of the facility's good-faith compliance efforts. The XL effort has been an attempt to demonstrate that sufficient regulatory flexibility exists within the current statutes to curb industrial pollution in a cleaner, more cost-effective manner. However, EPA policy fails to shield participants from third-party suits or from regulatory enforcement actions, making companies reluctant to participate.

OSHA Star is the main program in OSHA's Voluntary Protection Programs (VPP), adopted in 1982. These programs are voluntary, cooperative agreements among labor, management, and the Federal government. The primary goal is a reduction in workplace injuries and illnesses. Incentives for the participation of companies in OSHA's VPP are to bring recognition to companies, to refine a company's safety and health program by subjecting sites to OSHA's expert evaluations and recommendations, to allow companies to have good relationships with regulators, to boost employee morale and increase productivity, and to enhance a company's profits. As of May 1996, 191 work sites were participating in the Star program. OSHA states that the purpose of the VPP is to emphasize the importance of, encourage the improvement of, and recognize excellence in employer-provided, site-specific occupational safety and health programs. OSHA's VPP has certainly accomplished these objectives, but the GEMI report states that the data provided are weak and incomplete.

SO_2 emissions trading came out of Title IV of the Clean Air Act Amendments of 1990, which primarily regulates SO_2 emissions from electric utilities to reduce acid rain. Title IV grants utilities authorization to emit SO_2 in the form of emissions allowances beginning in 1995. One allowance authorizes the emission of 1 ton of SO_2. In Phase II the law entitles each affected company to receive only enough allowances to cover about one-half of its annual emissions released during the base period (1985 through 1987). Utilities that want to sustain their SO_2 emissions at 1985–1987 levels have to purchase the right to emit additional SO_2 emissions through the allowance trading system. Title IV also imposes an aggregate emissions cap of 8.95 million tons as a standard of performance that utilities must operate within. Thus, the regulation provides a performance standard but does not specify what actions the firm should take. Title IV was expected to have four major outcomes. First, the program was expected to result in SO_2 reductions greater than those required by Title IV or to achieve reductions earlier than anticipated, or both. Second, the program's flexibility was expected to minimize the overall cost of the program. Third, the program was expected to stimulate innovations in technology that would reduce emissions and conserve energy. Finally, the allowance system was anticipated to achieve cost-effective compliance while accommodating growth in energy demand. Early results show that the first three of these outcomes have been achieved and the fourth partly achieved. The GEMI report attributes Title IV's success to the flexibility allowed by its performance standards and to banking, which has spurred economic competition, technological innovation, and more efficient utility operations.

Level of Success Debatable

The GEMI report concludes that these Federal programs are relatively new, still being refined, and in need of more systematic evaluation. However, while EPA and OSHA indicate some level of success or progress with all the programs, the GEMI report also concludes that the five initiatives have not lived up to their promise for three major reasons: the lack of a statutory base, EPA management shortcomings, and pervasive mistrust among participants and stakeholders. The report (prepared by Resources for the Future) states that Federal programs need better implementation, including broader stakeholder participation in program design; clearer incentives and environmental protection objectives; a shared sense of purpose among Federal, regional, and state government officials; and a statutory base.

Information in this article is derived from *Industry Incentives for Environmental Improvement: Evaluation of U.S. Federal Initiatives*, a report prepared for the Global Environmental Management Initiative (GEMI), Washington, D.C., September, 1996. The report is available from GEMI, 1090 Vermont Avenue, NW, Third Floor; telephone: (202) 296-7449. It is also accessible via INTERNET at *http://www.gemi.org*.

OSHA Issues Final Rule on Abatement of Safety and Health Hazards

Effective May 30, 1997, the Occupational Safety and Health Administration (OSHA) issued a final rule requiring businesses to notify OSHA and inform employees that workplace hazards identified by inspectors had been abated. The new regulation applies to all employers who are cited under this rule, including general industry, construction, maritime, and agricultural employers, and ensures that workers are fully informed about serious hazards and actions taken to eliminate them.

Employers benefit from this new rule as it eliminates burdens that current verification procedures impose. OSHA will not require employers to prepare and submit abatement certification documents in cases where employers eliminate the hazards during the course of an inspection. Employers will no longer have to document actions taken to correct relatively minor (other than serious) violations as well as many violations classified as serious. For more information, contact Frank Kane at (202) 219-8151.

NEPA Web Resources Demonstrated at the 17th Annual Meeting of the International Association for Impact Assessment

Lee Jessee, from the Office of NEPA Policy and Assistance, demonstrated the Department's NEPA Web and CEQ Web sites to the International Association for Impact Assessment (IAIA) during a special session on electronic environmental impact assessment in New Orleans, Louisiana, May 28, 1997. The IAIA is a professional society dedicated to improving international capacity in environmental impact assessment. Lee emphasized that the President's Council on Environmental Quality (CEQ) has consolidated national and international Web resources into one national Web site—NEPAnet. She noted that this official government repository for NEPA (National Environmental Policy Act) information was activated at the Department of Energy (DOE) Conference Commemorating the 25th Anniversary of NEPA, in March 1995, and that the DOE NEPA Web has been linked to the CEQ Web since its inception.

The DOE NEPA Web is organized into five functional modules that enable users to easily navigate their own path to NEPA information. Recent enhancements are italicized in the features described below.

(1) DOE NEPA Announcements: Quick-reference announcements of DOE NEPA events, including public involvement opportunities and links to *Federal Register* notices.

(2) DOE NEPA Analyses: Full-text search and retrieval of EISs, EAs, *records of decision,* and *mitigation action plans,* links to *other agency NEPA documents.* A master list of all DOE EISs allows users to access archival information on EISs not available electronically.

(3) NEPA Links: Quick access to web sites of the EPA Office of Federal Activities, CEQ, and other agency and international NEPA-related web sites. A link to EnviroText provides full texts of Federal environmental laws and regulations, Executive Orders, and Native American Tribal codes.

(4) DOE NEPA Tools: DOE NEPA Order and Regulations, DOE NEPA guidance, including the Compliance Guide, contracting reform, and document preparation and Web publishing; the DOE NEPA stakeholder directory; and links to law references and the Library of Congress.

DOE NEPA Process Information: NEPA implementation reports and milestone data: A listing of EAs and EISs in preparation, fact sheets on DOE weapons complex NEPA reviews, *DOE Annual Planning Summaries,* and Lessons, Learned Quarterly Reports.

The CEQ is using Web-based technologies to avoid duplication of effort and expense in the conduct of the NEPA process. NEPAnet serves as the official repository of the nation's baseline environmental information. It also facilitates cost reductions in the NEPA process by delivering pertinent data on agency proposals to Federal decision makers, Congress, Native American tribes and citizens worldwide. Lee noted that the use of Web-based technologies to search across agency datasets enables efficient environmental impact on assessment of cumulative impact to regional ecosystems. CEQ hopes that both the use and quality of the national NEPA dataset will grow as Federal agencies use NEPAnet to perform their NEPA analyses. In the 21st century, CEQ expects NEPAnet to house the scientific knowledge needed to understand the interdependence between our species and the planet's ecology; the technical knowledge needed to understand advanced technologies as a cause of and a solution to environmental problems; and the knowledge needed to understand the cultural norms, legal codes, economic arrangements, and political institutions that control and use natural resources.

Recent Enhancements

Many enhancements have been made to NEPAnet and the DOE NEPA Web site to manage information in the framework of the Government Performance and Results Act goals and to help streamline the NEPA process. Through a link to the "mother" NEPAnet site, DOE NEPA practitioners now have access to an expanded source of online NEPA information, including CEQ regulations, guidance and annual reports, effectiveness studies, EPA filings and ratings, bibliographic and training information, professional associations, international environmental datasets, spatial data systems, and environmental analysis data links. Users can easily access exhaustive resources on pollution prevention; threatened and endangered species; wetlands; and meteorologic, hydrologic, geophysical, state, and regional data references. These Web resources bring existing and new environmental datasets to the DOE NEPA community via seamless Web linkages, without duplicating systems. Enhancements to the DOE NEPA Web are highlighted in the text box accompanying this article.

The Uniform Resource Locator (URL) address for the DOE NEPA Web Site is *http://tis.eh.doe.gov/nepa/*; the URL for NEPAnet is *http://ceq.eh.doe.gov/nepa/nepanet.htm*. For more information on the IAIA, access their Web site via NEPAnet.

If you have any questions on the use of NEPA Web resources or on electronic publication standards or would like to link a program or operations office Web site to the DOE NEPA Web site, please contact Lee Jessee, DOE NEPA Webmaster, at (202) 586-7600, or e-mail (*lee.jessee@eh.doe.gov*).

Society for Effective Lessons Learned Sharing Holds Spring Conference

Hosts John Wagoner, Manager of DOE-Richland, and Hank Hatch, President of Flour Daniel Hanford, welcomed the Society for Effective Lessons Learned Sharing to Richland, Washington, on April 1-2, 1997, for their spring meeting. The theme of the 2-day conference, attended by DOE and contractor representatives from across the complex, was "Utilizing Lessons Learned Information."

The Society is a volunteer organization whose members come from various DOE programs, Operations Offices, sites, and contractors. There are over 100 regular members from across the DOE community and associated members from other organizations that share similar learning goals. The Society's mission is to promote the process of identifying, sharing, and utilizing lessons learned from experiences—both within the DOE complex and outside it—to improve the safety, efficiency, and effectiveness of all Department work processes.

In his keynote address, Mr. William East of the U.S. Army Corps of Engineers described a design review lessons learned system being developed by the Army Corps Construction Engineering Research Laboratories. This lessons learned system attempts to capture both the successes and failures of experienced design and construction personnel. Mr. East stressed the role of corporate learning and the importance of capturing and sharing knowledge as contributors to the success of this project. Several members of the Society also made presentations. Topics included integration of lessons learned into corrective action management programs, recent improvements to lessons learned Internet sites, and lessons learned thus far from the Oak Ridge K-25 fatality.

The second day of the conference was devoted to highly interactive working sessions that fostered the exchange of ideas among Society members. In addition, an afternoon roundtable discussion focused on barriers to lessons learned sharing and utilization, an issue currently faced at several sites active in the Lessons Learned Program. Key barriers identified included lack of time and resources, difficulty in obtaining management approval, and information overload. The conference concluded with the compilation of an action item list to address these and other barriers to effective lessons learned sharing.

Conference attendees participated in morning working sessions to discuss ways to improve the dissemination and utilization of lessons learned information both across and outside of the DOE complex.

The Society for Effective Lessons Learned Sharing strongly encourages participation by individuals from all DOE programs and any others who are committed to building stronger communication ties across the complex. For more information, access the Society's Home Page from the DOE Lessons Learned Information Services Home Page located at *http://tis.eh.doe.gov/others/lll/lll.html.* You may also contact Bobbie Smith, Office of Environmental Restoration, at (301) 903-7435; e-mail (*bobbie.smith@em.doe.gov*) or Bill McQuiston, DOE-Idaho, at (208) 526-7373; e-mail *(mcw@tis.eh.doe.gov)* for information about the Society.

Office of Worker Health and Safety Conducts DOE-Wide Workshop to Discuss Development of New Technical Standard for Integrating Safety and Health into Facility Disposition Cleanup Work

On March 19-21, 1997, the Office of Environment, Safety and Health conducted a DOE-wide workshop at the Rocky Flats Environmental Technology Site to discuss the development of a DOE Technical Standard (SAFT-0060) for addressing safety and health during facility disposition activities. Sponsored and led by the Offices of Facility Safety Analyses (EH-32) and Field Support (EH-53), the technical standard initiative resulted primarily from a need to (1) reduce and mitigate the unique worker safety and health risks introduced by facility disposition activities (cleanup activities such as deactivation, decommissioning, surveillance and maintenance, and dismantlement that are required for the dispositioning surplus weapons-production facilities, buildings and structures); (2) help managers, supervisors, and workers who are involved with facility disposition work identify and control the unique hazards associated with this type of cleanup work; (3) address the managerial, regulatory, and technical issues associated with maintaining safety and health during post-operations activities; and (4) standardize and disseminate those cost-effective, successful, field-tested approaches to safety and health integration during post-operations activities.

The key workshop objective was to solicit input from the 70 DOE and DOE contractor personnel, including senior DOE managers, who were in attendance and who manage, supervise, or are involved with facility disposition activities related to the following:

- the need for a DOE technical standard for facility disposition activities
- comments and suggestions on a draft version of the standard
- any additional safety and health issues not currently addressed in the preliminary draft

The workshop also provided a focused forum through topic-specific breakout working session groups for exchanging safety and health experiences and strategies among DOE site and Headquarters personnel, as well as the opportunity for workshop attendees to participate in follow-on technical standard development activities.

The proposed technical standard development process to date has included salient safety and health facility disposition issues identification and resolution activities; facility disposition project data collection and analyses, largely conducted by a core team of safety and health experts, technical advisors, and senior-level decision-makers and managers representing Headquarters, the field offices and their contractors; consideration of external exigencies, including the Defense Nuclear Facilities Safety Board (DNFSB) recommendations; and coordination with the intent of other departmental efforts, such as the Integrated Safety Management System, Work Smart Standards, Enhanced Work Planning and Facility Disposition initiatives, underway through the Office of Environmental Management.

To be used primarily as a guidance tool, the proposed technical standard will provide recommendations for the resolution of major safety and health issues, including site-specific examples, with respect to facility disposition-related regulatory and other requirements clarification, and the development and implementation of project-specific, integrated safety systems.

Overall, workshop participants agreed that a need exists for the technical standard and suggested the following enhancements to maximize its utility.

- more focus on worker safety throughout the document
- more explicit guidance and illustrative examples on tailoring safety and health performance, expectations, and directives implementation for non-nuclear facility disposition activities
- more detailed safety and health issues resolution guidance for audiences with minimal facility disposition experience
- more explicit clarification of the intent of specific DOE safety and health orders applicable to facility disposition
- more emphasis on hazards management
- better linkage with the "EM facility disposition process," developed in support of DOE 430.1, *Life Cycle Asset Management*
- more focus on "grading" and "tailoring" safety and health guidance for the various phases of facility disposition based on the work type and hazards

In addition to incorporating these suggestions, EH-32 and EH-53 will continue to partner with key line organization staff, senior managers, contractor personnel, field office managers and the DNFSB to accomplish better integration and coordination with related departmental initiatives; continued issues identification and resolution through site visits; the implementation of small-scale pilot demonstrations of SAFT-0060 concepts at Oak Ridge and Hanford; and the release of a final draft of the technical standard for approval in September 1997.

For further more information, please contact Tony Eng, Office of Field Support, at (301) 903-4210; e-mail *(tony.eng@eh.doe.gov*) or P. K. Niyogi, Office of Facility Safety Analyses, at (301) 903-2421; e-mail *(pk.niyogi@eh.doe.gov)*.

OSHA Secretary Commends DOE's Safety Program

(L-R) Joseph Fitzgerald, EH-5, accepts department safety and health award from Joseph A. Dear, Assistant Secretary U.S. Department of Labor, OSHA, along with Charles Campbell, EH-51.

Joseph A. Dear, Assistant Secretary, Department of Labor, Occupational Safety and Health Administration (OSHA), commended the Department of Energy (DOE) safety program during the December 5, 1996, Metropolitan Washington Federal Safety and Health Council Annual Awards Ceremony and Program. The ceremony was held in Washington, D.C., where Dear recognized Joseph E. Fitzgerald, Jr., Deputy Assistant Secretary for Worker Health and Safety, and staff from the Federal Employee Occupational Safety and Health (FEOSH) team. Dear noted that DOE was instrumental in forging ahead in safety and health under difficult circumstances, such as the government shutdown.

A portion of Dear's keynote speech focused on DOE's cooperative effort with OSHA on the DOE Voluntary Protection Program, privatization issues, and support of council activities. Dear described the forward path OSHA was taking in the Federal and private sector arena and gave accolades to other Federal agency and department Designated Agency Safety and Health Officials and senior safety managers.

DOE was recognized with two safety awards and one employee award. Fitzgerald accepted the first safety award on behalf of Secretary of Energy Hazel O'Leary for departmental activities, such as hosting a 1-week Collateral Duty Safety course and utilizing the Forrestal building to host monthly council meetings. Fitzgerald also accepted the second safety award on behalf of Dr. Tara O'Toole, Assistant Secretary for Environment, Safety and Health (EH), for EH's assisting in the council's previous awards program and ceremony, participating in the DOE FEOSH Roundtable meeting, and extending an open invitation for council members to participate in the EH ergonomics initiative. A special achievement award was given to Charles Campbell of the FEOSH team for promoting the advancement of the FEOSH program.

The Metropolitan Washington Federal Safety and Health Council assists Federal and military organizations and employee representatives or officials in the Metropolitan Washington area to promote the reduction of injuries and illnesses. Another objective of the Council is the reduction of property-associated costs incurred by Federal and private-sector employees. Specific safety and health concerns—sharing of resources, awareness campaigns, training, coordination, and education—as well as safety and health activities, are support functions associated with the Council.

The Department exceeds the requirements of 29 Code of Federal Regulation, Part 160, "Elements for FEOSH Programs," by actively participating in Federal safety and health councils. For more information on the Metropolitan Washington Federal Safety and Health Council, contact Charles Campbell, Office of Occupational Safety and Health Policy, at (301) 903-1441 or e-mail *(charles.campbell@eh.doe.gov)*.

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